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March 24, 1956

VOL. 69, NO. 12 PAGES 177-192

SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE

Easter Symbols

See Page 187

A SCIENCE SERVICE PUBLICATION

GENERAL SCIENCE

Release "Secret" Data

➤ UNLOCK many of the classified files in Government research laboratories. Much information now stamped "Secret" could be made available without injuring national security.

Scientists agree that fewer restrictions on the flow of scientific information into and out of Government research laboratories would speed up this country's defense efforts.

They urge taking a "calculated risk" of releasing basic scientific facts to speed up research. They draw, however, a careful line between secrets of nature and the secret of how a weapon is constructed or exploded.

Competent scientists in any country can learn from experiments the same facts United States scientists learn. Many important discoveries are often made simultaneously in two or more laboratories where the scientists have not been in communication.

Various remedies have been proposed to alleviate the difficulties of present secrecy regulations, which are keeping from the public information needed to make policy in a democracy as well as slowing down scientific research.

One suggestion is to declassify documents automatically at the end of a stated period, to be specified when they are written, unless national security clearly would be jeopardized.

Another is to create a corps of scientists to decide from among the many new research results which few should be kept secret.

All information not directly related to weapons, their kind, number and how they work, should be published immediately, some scientists believe. The stimulus to research thus gained would far outweigh any possible loss by giving away "secrets."

Another idea is to classify by projects or subject matter rather than by "need to know." This would allow the cross-fertilization that has always proved essential to progress in science.

Some scientists urge setting up a uniform classification standard that would apply to all Government departments and agencies handling classified material. Regulations now vary from agency to agency.

An information problem not related to the national security concerns results of Government tests on industrial items, from nylon stockings to clinical thermometers, made in Government laboratories, the results of which are not made public.

The public, however, has paid for the research and there are many who believe the findings should be made available in specific rather than general terms.

These views were expressed by scientists testifying before the House Government Information subcommittee. Rep. John E. Moss (D.-Calif.) is chairman of the subcommittee. (See SNL, March 17, p. 175.)

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CHEMISTRY

Storing Sun's Energy

➤ HYDROGEN, lightest of the chemical elements, may prove to be the key substance in practical and economical use of energy from sunshine.

This possibility is brought out in a study of factors that will make conversion of solar energy more efficient by Dr. Rudolph J. Marcus of Stanford Research Institute, Stanford, Calif., and reported in *Science* (March 9).

Hydrogen is a chemically active gas capable of giving off a large quantity of heat when burned. The unburned gas can therefore serve as a means of storing potential chemical energy. Such a reservoir of potential energy is one of the necessary steps in making any system of photosynthesis practical as a source of useful energy.

In the green plant, life processes connected in some way not yet clearly understood with the green pigment in the chloroplast of the leaves are able to split water molecules into oxygen and hydrogen.

In the plant the hydrogen is not set free as a gas but is immediately used in chemical reactions that build up sugars by combining hydrogen with carbon dioxide. Man has learned in general what sugars are formed in this way and they are continuously torn down and rebuilt in a life cycle.

He has not yet, however, mastered a way to keep these cycles going without the plant's help.

In another approach to the problem of using sunlight's energy, a number of chemical reactions have been studied which, on a small scale, can break down the water molecule and release hydrogen as a gas. They do this by changing the valence, or power of entering into chemical combination, of one of the metals.

Iron, cerium and magnesium are metals capable of such a change of valence when activated by the sun's energy.

Five steps necessary to make utilization of the sun's energy practical in industrial processes are listed by Dr. Marcus. They are:

1. Collection of sunshine, either with or without concentrating it.
2. Conversion of solar radiation into other forms of energy.
3. Storage of potential energy in a readily available and convenient form.
4. Generation of power.
5. Application of power to do useful mechanical work.

Production and storage of hydrogen as a gas would meet the third of these needs, "storage of potential energy in an available and convenient form."

A number of possible ways of using the hydrogen thus stored are suggested by Dr. Marcus. Since two volumes of hydrogen combine with one volume of oxygen with explosive violence, as chemistry students well know, to form water, Dr. Marcus contemplates burning the hydrogen either in an internal combustion engine or in two ram jets firing in opposite directions on a rotating bar connected to a generator.

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GENETICS

Foresee Safe Methods Of Sex Determination

➤ SAFE METHODS for determining that offspring will be of the desired sex "are sure to be found," Dr. H. V. Brondsted of the University of Copenhagen, Denmark, states in a report originally made to UNESCO and reprinted in the *Bulletin of the Atomic Scientists* (March).

The old wives' tale of a malformed child resulting from severe fright or shock to the mother during pregnancy gains some support from recent scientific findings, Dr. Brondsted also points out in his summary of recent world-wide research in embryology.

The effect of shock would come through disturbance of the balance of hormones in the body. This might be upset by the stress of the shock acting through the adrenal and pituitary glands.

Dr. Brondsted's prediction of sex determination at will is based also on animal studies that indicate the possibility of this, at least for cattle, and perhaps after that for humans. So far definite results have not yet been obtained even for cattle.

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PALEONTOLOGY

Saw-Toothed Birds Among 400 Fossils

➤ GROTESQUE, saw-toothed, lizard-like creatures with wings are among more than 400 North American and West Indian fossilized birds recently tabulated by Dr. Alexander Wetmore, Smithsonian Institution research associate.

Dr. Wetmore's checklist shows that nearly 100 new species of fossil birds have been recognized in North America and the West Indies since 1941.

Because of their fragile bones and aerial way of life, birds are much less likely to become fossilized than sturdy-boned mammals and reptiles. Many of the fossils found are incomplete. About half represent species not yet extinct.

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PUBLIC HEALTH

Nerve Gas Antidote

The chemical 2-pyridine aldoxime methiodide, known as PAM, found to counteract effects of nerve gases. Discovered during study of the chemistry of nerve impulse transmission.

► THE UNITED STATES has a new and powerful antidote for nerve gases. It is 100% effective in mice. Whether it has been tested on larger animals or man is not known.

Scientists who made the nerve gas antidote, called PAM, hope they are also on the road to conquest of certain diseases, such as disabling and incurable myasthenia gravis. The nerve gas antidote resulted from study of the chemistry of nerve impulse transmission, the basic defect in myasthenia gravis.

The nerve gas antidote is 2-pyridine aldoxime methiodide, shortened to PAM.

Mice given lethal doses of the nerve gas DFP, or diisopropylfluorophosphate, or the chemically related insecticide, paraoxon, were all saved by injections of PAM into the belly. This antidote was injected within one or two minutes after injection of the poisons under the skin.

How fast PAM must be given humans to save them after exposure to a nerve gas or insecticide is not known. Dr. Irwin B. Wilson and his associates at Columbia University have tested the compound only on mice that got the usually fatal doses of the poisons. The doses of poisons were so big some of the mice died within five minutes and the bulk of them within a half hour when not given PAM.

PAM was made by Dr. Sara Ginsburg according to specifications drawn by Dr. Wilson. He was able to draw them because he had studied the molecular forces and chemical changes occurring when a body chemical, cholinesterase, hydrolyzes and breaks down another chemical, acetylcholine.

This chemical, ACh for short, transmits nerve impulses, or messages, across nerve junctions. After the impulse has been transmitted, the ACh must be destroyed so the nerve can be readied for the next impulse. Normally, cholinesterase does this.

Cholinesterase is blocked in this vital nerve function by nerve gases and related compounds.

The nerve gases do this by adding a phosphorus-containing group to cholinesterase. When an acetyl group is transferred to cholinesterase, the acetyl group reacts with water in microseconds. The phosphorus-containing group from the nerve gases takes days to react with water. Hence the difficulty in getting it loose from cholinesterase in time to save nerve gas victims.

Electric eels helped Dr. Wilson draw his specifications for the nerve gas antidote. The electric charges accompanying nerve activity are much larger in eels than in humans. Large specimens of eels can deliver one ampere at 600 to 700 volts, although for only a very short time.

Studying cholinesterase, the nerve chemical, from eels showed the nerve chemical contains a negatively charged electrical center near the site where the phosphorus group from nerve gases attaches itself.

This gave the idea that a chemical with a positively charged center in the right position should have ability to remove the phosphorus group from cholinesterase and thus reverse nerve gas damage.

By exploiting this and other knowledge of cholinesterase, Dr. Wilson arrived at the formula for PAM. When Dr. Ginsburg had made the compound and it was tested on mice, its value in saving the lives of the animals proved "dramatic and certain."

PAM is a crystalline solid which dissolves in water to give a clear yellow solution. It is easily and inexpensively synthesized. The compound itself, in amounts necessary to preserve life, is not toxic.

Associated with Dr. Wilson in the development of PAM was also Dr. Helmut Kewitz, Ford Foundation fellow from Germany. Some of the basic research on cholinesterase had previously been done by another Columbia scientist, Dr. David Nachmansohn.

The Columbia work was supported in part by the U. S. Public Health Service, the Army's Office of the Surgeon General and the Atomic Energy Commission.

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TECHNOLOGY

Squeezable Plastic Can Designed for Home Use

► HOUSEWIVES will soon be able to buy many household goods in the plastic counterpart of the tin can.

The new can-like container is made of a squeezable polyethylene plastic sleeve with a metal top and bottom crimped onto it.

It is primarily designed for use with liquids and powders. The plastic can also features a new spout that releases the contents at any angle when the body of the container is squeezed.

The container, a development of the Bradley Container Corporation, Maynard, Mass., will be marketed in sizes that range from eight to 32 ounces.

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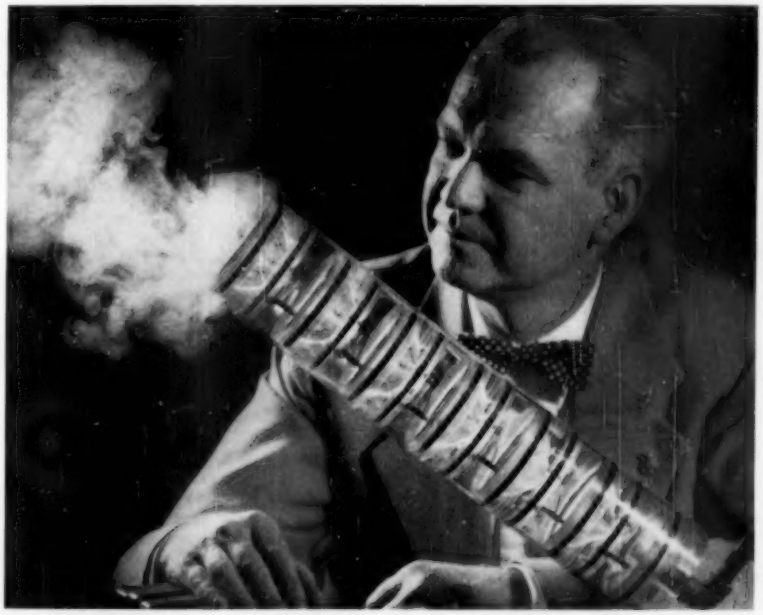

MEASURING PARTICLE SIZE—To measure the size distribution of particles dispersed in air, the cascade impactor shown here was developed by scientists at Battelle Memorial Institute, Columbus, Ohio, for the Army Chemical Corps. Increasing speed and inertia are imparted to particles as aerosols are drawn through a series of funnels with successively smaller openings. When the inertia of the particles overcomes air drag, they impact on the various slides for later detection.

PSYCHIATRY

Measure Insanity Level

➤ HOW CRAZY can you get? A serious answer to this popular question may come from research reported by Dr. Ogden R. Lindsley of Harvard Medical School, Boston, at the mid-Atlantic regional research conference of the American Psychiatric Association at Georgetown University School of Medicine, Washington, D. C.

Dr. Lindsley and associates are seeking an objective measure of the fine differences in behavior between mental patients. They hope to be able to give numerical values to different kinds of behavior.

At present all patients with certain general kinds of abnormal behavior get the diagnostic classification of schizophrenia. Psychiatrists know there are differences in schizophrenia patients. They have not, however, good measures or ways of detecting these fine differences, the way differences between normal and cancer cells can be told with a microscope.

Dr. Lindsley cites the man who kept pulling the lever as an example of the kind of behavior differences among mental patients. The lever was on the slot-machine equipment devised by Dr. B. F. Skinner of Harvard to study behavior, used first for studies of animals, then rigged for studies of mental patients.

When the patient pulls a lever he gets a candy bar, a cigarette, a jellybean or some other "reward." When the machine's circuit is broken, he no longer gets a reward for pulling the lever. All normal people and all animals tested stop pulling the lever after a few tries when no reward is delivered.

The patient cited, however, kept pulling the lever an hour a day every day for 150 days even when no reward came from the machine. He was the only one out of 70 patients tested who did this.

The rigged slot machine method for studying behavior differences is called the "operant conditioning method." It differs from the reflex conditioning methods of the Russian scientist, Pavlov. In operant conditioning, the patient does not have to pull the lever, or make a response. In reflex conditioning, the animal or person is forced by an electric shock to move, or respond.

How differences in motivation affect behavior can be learned through this method, even when the patients are so sick mentally they will not tell anyone how they feel or what motives make them act in a certain way.

A few patients, for example, will pull the lever to make the machine give milk to a hungry kitten, although they would not pull it to get candy or some reward for themselves.

Some patients have apparently been helped by the testing, although it was not intended as a treatment method. After many hours of operant conditioning, they responded, or pulled the lever, many more times each hour than they had at first.

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ENGINEERING

Will Build Israeli TVA

➤ BY 1965, Israel will have the most complicated, and possibly the most extensive, irrigation system in the world.

Plans for the Israeli equivalent of our TVA were outlined to SCIENCE SERVICE by Paul H. Doron, an Israeli engineer who is in charge of the ten-year project.

When completed, the irrigation and hydroelectric scheme will make Israel an agriculturally self-sufficient nation. It will increase the number of irrigated acres from 250,000 to 750,000 acres. This will represent three-fourths of the total irrigable land in the small Middle Eastern state. It will mean a food supply for a population of 3,000,000. Israel's current population is more than 1,717,000 persons.

The head of the system is the Jordan River that runs down the eastern border of Israel and ends in the Dead Sea. The system's body is made up of secondary irrigation systems, district water supplies and just about every well in the nation. Backbone for the project is a series of open canals linked to an 85-mile long pipeline.

Building the irrigation project can be likened to tackling the job of constructing a superhighway directly across the United States and then linking every primary and secondary road in the country to it.

The water diverted from the Jordan will be sent either into the Biblical Sea of Galilee, which will also act as a storage reservoir, or down the center of the ancient land in a modern aqueduct. The main pipeline will be 108 inches in diameter and will be made of pre-stressed concrete.

There will be interchanges along the main pipeline that will link it to four secondary irrigation systems, to be built, as well as every other water system in the country, including individual village wells.

Villages that have underground water reservoirs will use water from the main system and stockpile the natural water by leaving it untapped. In dry years, a water-rich community can then send its well water through part of the irrigation system to a water-poor settlement. The next year, if needed, the situation can be reversed.

Every available drop of water will be utilized in the complex and intricate system. Salt water in one section of Israel, for example, will be sent along with sweet water to a mixing plant and then the mixed water redistributed.

In another instance, salt water found in springs along the Sea of Galilee will be diverted to settlements for use in their fish breeding ponds. This reduces the salinity of the Sea and helps the fish breeders.

A second pipeline of similar capacity to that planned will eventually be built to run alongside the first. This conduit will act as a main regulator for the entire set-up.

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ANIMAL HUSBANDRY

Larger Thyroid Glands May Mean More Eggs

➤ BIGGER THYROID GLANDS in poultry and cattle may result in greater production of eggs and meat.

Experiments on New Hampshire Red chickens at the Agricultural Research Center in Beltsville, Md., are expected to show whether fowl with extra-large thyroids can outgrow and outproduce their small-thyroid competitors.

If this proves to be true, thyroid size may become an important factor in breeding.

For experimental purposes two lines of New Hampshire Reds have been developed by poultry geneticists C. W. Knox and W. E. Shaklee of the center. In one line the average thyroid weight is 32.8 milligrams, almost double the 18.2 milligram average of the other strain.

The two groups of chickens will get identical rations and will be raised under the same environmental conditions, it is reported in *Agricultural Research* (March).

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BIOCHEMISTRY

Redheads' Difference Found in the Pink

➤ REDHEADS have something that apparently no one else has. It is trichosiderin.

Neither fatal nor responsible for the legendary anger of redheads, trichosiderin is a pink pigment found only in red hairs. It does not appear in non-red hairs, Dr. N. A. Barnicot of University College, London, reports in *Nature* (March 3).

In tests with "bright red hair," trichosiderin was extracted chemically. Twenty other shades of hair, including albino hair, failed to produce trichosiderin or a pink color, but did produce varying hues of yellow, the British scientists report.

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HOME ECONOMICS

Mildew May Make Kitchen Walls Gray

➤ KITCHEN WALLS with a "tattle-tale gray" look may not be dirty but mildewed.

Cooking often makes fumes that are loaded with nutrients on which mildew organisms and bacteria can feed. To prevent this, opening the windows or using fans to get cooking fumes, heat and odor out as fast as possible can be tried.

When mildewing has already occurred, the Hospital Bureau of Standards and Supplies in New York suggests the following treatment:

"Scrub with a good cleaning solution and spray with any effective disinfectant. These treatments must be repeated at intervals of two weeks to one month, depending upon conditions."

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RARE BASSARICYON—Now on view in Washington's National Zoological Park, the bassaricyon is the first to be displayed in any zoo anywhere in the world since the London Zoo's specimen died about 130 years ago. Native to South America, the bassaricyon resembles the kinkajou.

PSYCHOLOGY

Solitary Mind Active

➤ ISOLATION makes the mind turn inward. It does not drift into a state of half-sleeping or semi-consciousness.

Instead, the brain stays active and accumulates surplus energy to extreme degrees. A reintegration of the personality may result.

These are among the findings of preliminary studies of isolation reported by Dr. John C. Lilly of the National Institute of Mental Health, Bethesda, Md., at a mid-Atlantic regional research conference of the American Psychiatric Association held at Georgetown University School of Medicine, Washington, D. C.

Dr. Lilly made his findings by having himself suspended in a tank of slowly flowing water. The temperature of the water was about 94 degrees, just below normal body temperature. He wore nothing but a blacked-out headmask for breathing.

The object of the experiment was to find out what happens to the normal healthy human mind when it is freed of all stimuli through sight, hearing and sense of touch, and from directing any outward activity such as talking or physical movement. In other words, the mind was as completely isolated as it could be made.

Possible applications to "brainwashing" and its opposite, psychiatric treatment of mental sickness, can be made from the findings, Dr. Lilly suggested.

For about the first three-quarters of an hour, Dr. Lilly reported, he was aware of his surroundings. The mind is thinking about recent problems, what has been going on since arising that morning, and so on. The experiment is always started after a full night's rest.

Gradually he began to relax and "more or less enjoy the experience. The feeling of being isolated in space and having nothing to do is restful and relaxing at this stage."

Once, after two and a half hours in the tank, Dr. Lilly reached the state of visual imagery when he began to see things.

Forms appeared. They were small, strangely shaped objects with self-luminous borders. A tunnel whose inside "space" seemed to be emitting a blue light then appeared. At this point leakage of water into the mask stopped the experiment.

The results, Dr. Lilly pointed out, are similar to those reported by polar explorers who have lived alone or persons who have sailed alone in a boat for long periods.

From such studies psychiatrists may get what they have not yet had, "a full documented picture of the range available to the healthy human adult mind."

They may get a clearer, sharper picture of some of the causes of mental illness.

Still to be learned are the effects, in addition to isolation, of loss of sleep, starvation and other things which have "great power in changing healthy minds to sick ones."

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ANTHROPOLOGY

Ancient Bones Puzzling

American anthropologists reserve judgment concerning whether 10,000,000-year-old bones found in Italian coal deposits are human or in ancestral line.

➤ THE HUMAN-LIKE CREATURE who left his bones in the coal deposits of Tuscany, Italy, some 10,000,000 years ago may be "one of Nature's experiments," in the opinion of some anthropologists in this country who have seen the bone fragments in New York.

The creature may not have been in the direct line of descent of modern man or, in fact, of any now existing animal.

"Extremely interesting and important, whatever they turn out to be," is the judgment of Dr. William L. Straus Jr., anthropologist of Johns Hopkins University, Baltimore. He advises caution in making any final judgment on the basis of such fragmentary evidence.

In general, American scientists are reserving judgment on the rare collection of bones which, although discovered in an Italian mine as long ago as 1869, were recently shown to scientists in New York for the first time. Americans have, however, in the past studied casts and photographs.

The actual bones were brought to the United States by a Swiss scientist, Dr. Johannes Hurzeler, under the auspices of the Wenner-Gren Foundation.

There is absolutely no justification for reports that the find conflicts with Darwin's theory of evolution, Dr. Straus told SCIENCE SERVICE. Neither is the idea new that the ape evolutionary line and the human line separated in the very distant past, he pointed out.

One reason why there has not been more scientific discussion of the Bamboli bones is because the paleontologist who first reported them, Dr. Paul Jervais, was mistaken in his classification. He called them the bones of monkeys.

The ancient bones, from about 12 individuals, consist mostly of jaw pieces and teeth with a few fragments of leg and arm bones.

The shape and size of the teeth show strikingly human-like characteristics. They show the creature had a short face, a rounded chin and a slanted opening in the nose.

In these features, he was like a man. The canine teeth were much smaller than those of an ape and there was no gap between canine and premolar, or bicuspid, as there is in the ape.

The front end of the jaw shows that the face went straight down—the front teeth nearly vertical—so there was no "simian shelf" such as characterizes the ape.

Anthropologists want to know much more, however, before accepting this ancient creature as a man or the direct ancestor of modern man. They want to know, for example, the size of the brain; there are no bones from the top of the skull to show this. They want to know whether he walked erect; the tiny fragments of the leg bones cannot show this.

Dr. Helmut de Terra, European-born geologist of Columbia University, who is acting as interpreter and host for Dr. Hurzeler, believes there is a good chance of finding more of the bones of the human-like creature, needed by scientists to answer their questions.

Untold numbers of the rare bones from the Tuscany mines have already been lost to science. It is rumored that an entire skeleton was thrown into the furnace with the coal in which it was embedded. In addition to the man-like fragments, bones of mastodon, antelopes, and other animals were found.

Dr. de Terra plans to go to Italy and aid Dr. Hurzeler in searching for additional bits of the bones.

The ancient creature has been given the scientific name *Oreopithecus Bambolii* Jervais. The first part of the name means mountain ape, and the second part is for Monte Bamboli, the Italian mountain where the bones were found embedded in coal deposits some 10,000,000 years ago.

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CHEMISTRY

Refrigerant Gas Lubricates Metals

➤ FREONS, the gases that circulate in domestic refrigerators, have been tried out as lubricants for machinery run at high temperatures.

Known for their ability to withstand temperatures at which ordinary lubricating oils would evaporate and might catch fire, the freon gases have been suggested as substitutes for liquid anti-friction materials.

Their behavior in preventing surface damage to machine parts made of various kinds of hard metals has been studied by S. F. Murray, R. L. Johnson and M. A. Swikert of the Lewis Flight Propulsion Laboratory of the National Advisory Committee for Aeronautics, Cleveland, Ohio.

Action of the gaseous freons, which owe their fireproof quality to the chlorine and fluorine combined with carbon in their structure, seems due to a slippery film formed by chemical combination of the gas with the machine's iron or other metal.

Tool steels gave the best performance with the gaseous lubricants in this study, and results were most satisfactory when the two surfaces being lubricated were of nearly the same hardness.

Tool steel in contact with beryllium copper or with monel metal was effectively lubricated, but stainless steel showed excessive damage. Parts plated with silver to reduce friction were also damaged by the gaseous lubricant.

The tests are reported in *Mechanical Engineering* (March).

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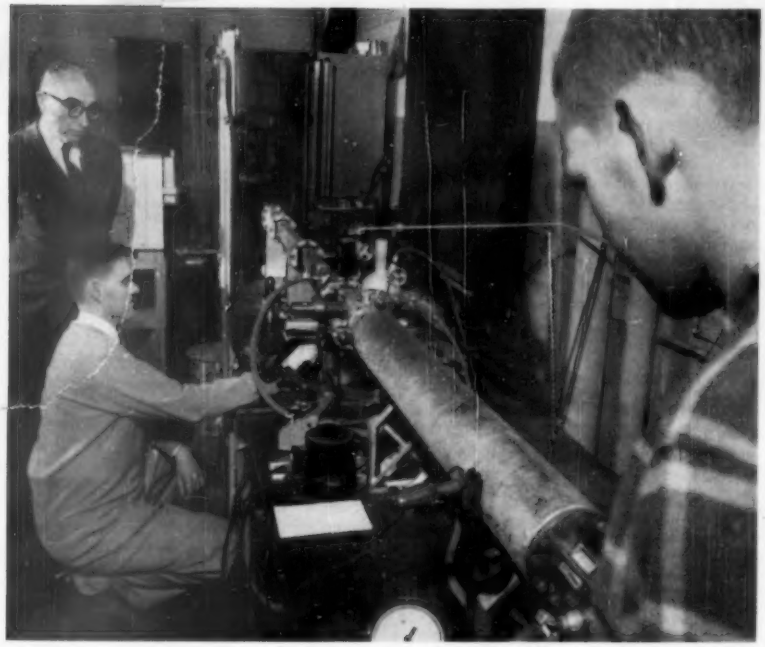
TEN MILLION YEARS OLD—These teeth are no ordinary teeth. They were found imbedded in coal in an Italian mine where they were laid down millions of years ago. They were shown in New York by a Swiss who believes they were human. Americans are reserving judgment.



CREATE LABORATORY "STAR"—Temperatures of 15,000 degrees, almost three times as great as those on the surface of the sun, are produced for split seconds in this University of Michigan shock tube, providing information of great value to astronomers in learning about stellar composition. In the foreground, Thomas D. Wilkerson opens the valves that control the supply of high-pressure gas into the shock tube, while research associate Eugene Turner watches a gauge and Prof. Otto Laporte supervises.

PHYSICS

Reach Star Temperatures

➤ STELLAR TEMPERATURES, about three times as high as those of the sun's surface, have been reached momentarily in the laboratory, a University of Michigan physicist has reported.

Dr. E. B. Turner told the American Physical Society meeting in Pasadena, Calif., that the 15,000-degree temperatures were generated in a shock tube, after a diaphragm separating gases under extremely high and low pressures is broken. (See SNL, Oct. 16, 1954, p. 247.)

Shock waves, because of the stellar-like temperatures they generate, have been suggested as a method of triggering hydrogen bombs without exploding an atomic bomb. Doing so might be one way of building baby hydrogen bombs. (See SNL, July 30, 1955, p. 76.)

As a high-pressure gas rushes into a low-pressure zone, a powerful shock wave is produced. In the University of Michigan instrument, it moves along the 12-foot tube at 10 to 20 times the speed of sound.

Since heat is the energy of atoms in motion, the violently agitated gas particles in the shock wave's wake reach incredibly high temperatures for an instant.

This heat is partially dissipated in the form of brilliant light, then is quenched by the cool "pushing" gas. So short-lived is the shock wave it does not have time to heat the walls of the tube.

By observing the characteristic light, or spectral lines, of the excited atoms at one end of the shock tube, physicists gather data under known conditions that can then be used by astronomers to check their interpretations of stellar spectra.

Present experiments center around the spectral lines of hydrogen, a major component of nearly all stars, including the sun. These lines vary in brightness and shape, depending on conditions at their source.

Dr. Turner told the Physical Society's Division of Fluid Mechanics they have now obtained quantitative measurements on spectral line shapes, using a revolving drum camera.

Dr. Turner said the shock tube will be valuable in helping to determine the amounts of elements present in stars. Although now astronomers can tell what elements are present, there is no reliable way to measure the quantity.

•RADIO

Saturday, March 31, 1956, 2:05-2:15 p.m. EST

"Adventures in Science" with Watson Davis, director of Science Service, over the CBS Radio Network. Check your local CBS station.

Dr. Gerald D. Dorman, president of the Medical Society of the County of New York, 2 East 103rd Street, New York 29, N. Y., will discuss "Public Services of a Medical Society."

ASTRONOMY

Second Comet of Year Spotted in Eastern Sky

➤ A NEW COMET, the second to be discovered this year, has been spotted in the eastern sky by a Czechoslovakian astronomer, Harvard College Observatory reports.

The comet is magnitude nine, bright enough to be seen with binoculars away from city lights. It is in the constellation of Ophiuchus, the serpent holder, which rises in the east about midnight.

Antonin Mrkos of the Skelnate-Pleso Observatory in Czechoslovakia, who discovered the comet, last year found the first comet in seven years bright enough to be seen with the naked eye from the Northern Hemisphere. (See SNL, June 25, 1955, p. 404.)

When found, the comet's position in the sky was right ascension, 18 hours, 20 minutes; declination, plus six degrees, 30 minutes. It was spotted at 2:30 a.m. Universal Time, on March 12.

MEDICINE

Anti-TB Drug Needs Metal for Cure Effect

➤ THE SECRET of how isoniazid, one of the big three anti-TB medicines, acts to stop tuberculosis germs in the body is announced by five Australian scientists in *Nature* (March 10).

The five scientists are Drs. S. D. Rubbo and Janice Edgar of the University of Melbourne and Drs. J. Cymerman-Craig, G. N. Vaughan and D. Willis of the University of Sydney.

Isoniazid, or INH for short, is active against TB germs after it has formed a special combination with a metal. The combination is the kind chemists call a chelate complex. A chelate complex of INH with copper is very active against TB germs both in the test tube and in laboratory animals.

The copper-INH combination is, the scientists report, as active as any drug they have so far tested.

The copper combination, however, is very toxic. Since INH does not show toxic effects in the body, the scientists feel sure it must work by combining with another metal in the body. So far, they do not know what this metal it. They are now testing other metal chelate complexes with INH to try to find one that is active against TB germs and non-toxic.

MEDICINE

Germ Danger Greatest in Early Use of Cortisone

➤ PATIENTS getting cortisone for arthritis or other diseases should be especially protected from germ infections during the early stages of the cortisone treatment, Drs. T. Nicol and R. S. Snell of King's College, London, warn in *Nature* (March 3).

Their warning is based on the finding that cortisone depresses the activity of the body's scavenger cells, the reticulo-endothelial macrophages, especially in the spleen. This seems to be the way the body's defenses against invading disease germs are lowered.

The defensive reticulo-endothelial system, however, recovers to about its normal level after the initial marked depression in the early stages of cortisone treatment.

The findings were made on guinea pigs given a dye that the reticulo-endothelial system normally would detoxify. Depression of the system in the first two weeks of cortisone treatment of the guinea pigs and subsequent recovery were shown by how the system handled the dye.

Science News Letter, March 24, 1956

MEDICINE

Arthritis Remedy Aids Hay Fever Patients

➤ GOOD RESULTS with what is believed the first use of a new chemical relative of cortisone for nasal allergy, or hay fever as the layman would term it, are announced by Drs. Jack R. Anderson and Henry D. Ogden of New Orleans in the *Annals of Allergy* (Jan.-Feb.), official publication of the American College of Allergists.

The cortisone relative they tried is prednisolone. This new compound was first announced less than two years ago as a potent drug for relieving arthritis. (See SNL, Nov. 13, 1954, p. 312.)

Now it is reported a "rapidly acting and highly effective medication for topical use in the treatment of nasal allergy."

The drug is used as a nose spray. An advantage of giving it this way instead of by mouth or hypodermic injection is that undesirable effects on the body generally are likely to be avoided.

Patients in the trial were told to give one squeeze of the plastic spray bottle into each nostril every half hour while awake. They did this for the first 48 hours. After this, they were told to reduce the dosage to one spray into each nostril four times a day.

At the end of one week, the 30 patients in the trials had a rest interval. Then they got another bottle of spray to use the same way for a week. After a second week's interval, a third bottle was given.

One bottle contained a dummy solution, or placebo, containing no prednisolone. The other two had prednisolone in different amounts.

The doctors did not know until the end of the tests which bottle was which. This information was known only to the manufacturer, the Upjohn Company of Kalamazoo, Mich.

None of the patients who got the placebo showed any clearcut improvement that either they or the doctors could tell. All who got prednisolone reported various degrees of improvement that the doctors also found in examining them.

Although the number of patients in the trial is small, their careful selection as having true nasal allergy and the "double blind" test lead the two doctors to believe that the new drug is effective.

Science News Letter, March 24, 1956

ARCHAEOLOGY

Swanscombe Skull Still in Doubt

➤ SWANSCOMBE MAN is still a puzzle to scientists, despite the finding of a new skull fragment that fits on to the famous Swanscombe skull.

No one can say definitely whether this man, who lived in what is now Kent, England, some 200,000 to 300,000 years ago, was a true Homo sapiens type and therefore a direct ancester of modern man, or whether he was a Neanderthaler and hence a sort of uncle of ours.

This is revealed by Dr. William L. Straus Jr., anthropologist of Johns Hopkins University, Baltimore, in *Science* (March 9). While he was in England last summer, Dr. Straus was invited to examine the new skull fragment and to share in digging at the Kent site.

Dr. Straus says he "harbors no reasonable doubt" that the new fragment, found last July by Dr. J. Wymer, is another part of the same skull as are the fragments found 20 years ago by Dr. A. T. Marston.

Dating of the skull is also well established as of the second interglacial period, some 200,000 to 300,000 years ago. Near the skull fragments were also found remains of other mammals and flint tools of the middle Acheulian phase of Stone Age culture.

However, despite their great antiquity, the Swanscombe fragments are indistinguishable from the corresponding head bones of modern man. This has led "some enthusiasts" to believe as established fact that a true sapiens type lived in Europe at the same time or even before the Neanderthalers.

This conclusion is premature, Dr. Straus states.

Other scientists have expressed the opinion that, when more pieces of Swanscombe Man have been unearthed, he will be found to be like Steinheim Man and thus Neanderthaloid rather than sapiens. This, Dr. Straus says, is just as much of a guess as the conclusion that Swanscombe was sapiens.

Dr. Straus is hopeful, however, that sooner or later Dr. Wymer and his associates will come across other and more critical parts of the Swanscombe skeleton and that they will reveal the Swanscombe's true nature.

Science News Letter, March 24, 1956

IN SCIEN

GENERAL SCIENCE

Science and Engineering Preferred by Students

➤ A HIGH PERCENTAGE of the nation's college-bound youngsters want a career in science or engineering, the National Merit Scholarship Corporation has reported.

Of the 5,078 semi-finalists in the Corporation's nation-wide hunt for the most able high school seniors in all fields of study, 56% of the boys and 16% of the girls named science or engineering as their career goals.

More than a third of the girls want to be teachers and about ten percent of both boys and girls want careers in medicine or health sciences. Eight percent of both groups combined want to go into business, and law attracts another eight percent of the boys.

The final winners in the Corporation's selection will share $3,000,000 in scholarships this year.

Science News Letter, March 24, 1956

GEOPHYSICS

Predict 1957 Will Bring Next Sunspot Maximum

➤ MID-1957 will bring the next high spot in the current solar cycle, Prof. M. Waldmeier, director of the observatory at Zurich, Switzerland, predicted.

An analysis of the increase in the number of sunspots during the last year and a half led Dr. Waldmeier to this conclusion.

For many years scientists have tried various formulas in attempts to forecast the ups and downs of sunspot activity. No formula has yet proved successful.

Dr. Waldmeier's prediction puts the maximum somewhat earlier than expected by the international group of scientists who planned the International Geophysical Year to coincide with the period of highest solar activity.

The IGY starts officially on July 1, 1957, and lasts for a year and a half, although some preliminary measurements for it are being made now.

Observations since the last low point in solar activity, which occurred in April, 1954, show a rate of increase in the number of sunspots that suggests there should be more spots than ever before visible during the next maximum, Dr. Waldmeier calculates.

With the peak expected in mid-1957, the length of the current solar cycle would be only 10 years, instead of the usual 11-year period.

Dr. Waldmeier calculated the intensity and exact time of the next high point from the rate at which solar activity increased at the beginning of the current cycle.

Science News Letter, March 24, 1956

CE FIELDS

PSYCHOLOGY

Chimps, Too, Get Tired of Toys

➤ CHIMPANZEES, as children do, like novelty in playthings.

A young chimp, when presented with a group of toys, will reach for one he has not seen before in preference to those he has been playing with earlier that day or even on previous days, Dr. W. I. Welker found at the Yerkes Laboratories of Primate Biology, Orange Park, Fla.

The chimpanzee has other reasons, in addition to novelty, for making a favorite of a particular plaything. He prefers round or rounded objects to those that are angular. He likes larger, brighter objects and those that differ from other toys in appearance.

The animal's age makes a difference in his reception of playthings. The younger chimp (three to four years old) is more responsive to all toys than are his elders (seven to eight years old).

The animals wanted to continue playing as long as new toys were periodically introduced, Dr. Welker observed. Details of the study are reported in the *Journal of Comparative and Physiological Psychology* (Feb.).

Science News Letter, March 24, 1956

PSYCHOLOGY

Single Men Show Good Attitude on Children

➤ SINGLE MEN in college show up well as prospective fathers when scored on attitudes toward child guidance, a study reported in the *Journal of Home Economics* (Feb.) shows.

The findings come from a survey including items such as:

"Children should be allowed to go to any Sunday School their friends go to."

"Parents are not entitled to the love of their children unless they earn it."

"Children should not be punished for disobedience."

The single men were asked whether they agree or disagree and how strongly or mildly with each of these and other statements. The entire test is known as the University of Southern California Parent Attitude Survey.

Scores of the single men were similar to those reported for parents of non-problem children and "markedly superior" to scores of mothers of problem children, obtained in other studies. They were not as good, however, as the "ideal" scores of clinical psychologists.

Single women in college scored much like the single men. Responses on the Ignoring variable showed there might be room for some improvement in this attitude before the students become parents.

The Ignoring variable refers to a tendency to disregard the child as an individual member of the family, to think of a "good" child as one demanding least parental time, and to disclaim responsibility for the child's behavior.

The study of single men is reported by Dr. James Walters of Oklahoma A. and M. College, Stillwater, Okla., and Miss Barbara Bridges of Mississippi College, Clinton, Miss. The test was given to 207 men in these two colleges and in the University of Colorado, University of Connecticut, University of Oregon, Florida State University and Washburn Municipal University at Topeka, Kans.

Science News Letter, March 24, 1956

PSYCHOLOGY

Twins More Liable To Speech Defects

➤ TWINS are more likely to develop speech defects than non-twins. So are the younger children of large families compared to older children of the large families or those in small families.

This was the unexpected finding of a study by Dr. Benjamin Pasamanick of Columbus, Ohio, Miss Frances K. Constantinou, registered nurse of Baltimore, and Dr. Abraham M. Lilienfeld of Buffalo, N. Y. The study, made of records of 290 children born in Baltimore since 1940, is reported in the *Journal of Diseases of Children* (Feb.) published by the American Medical Association.

The children were all mentally normal and did not have cerebral palsy. The scientists had thought the records of these children might show complications of pregnancy and birth, prematurity or abnormal conditions of the newborn that might account for the speech defects.

However, no more of these conditions were found in the 290 with speech defects than in a similar number of normal children without speech defects.

Discovery of more twins and later-born—third, fourth or fifth—children in the group with speech defects leads the scientists to suspect psychological factors.

Twins who have more contact with each other than with older children learn from each other babyish, faulty ways of talking, the scientists think.

These faulty speech patterns become fixed in the twins due to their closeness and the fact that they can understand each other's impaired speech.

As to the younger children in large families, the scientists suggest "rivalries, disorganizations and frustrations in large-family living" as possible causes of the speech defects.

Older members of the family become impatient with the young children's talk, and mother may be too busy to pay enough attention to it.

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BIOCHEMISTRY

High Blood Sugar Slows Cancer Growth

➤ HIGH BLOOD SUGAR slows down cancer growth temporarily, at least in mice, Dr. Ralph McKee and Jo'Ann Jehl, University of California at Los Angeles physiological chemists, have found.

Mice were injected with alloxan, which acts on the insulin-producing mechanism in the pancreas, thus producing diabetes. Cancer was introduced into these same mice by injection of highly infective Erlich's ascites mouse tumor cells.

The rate of tumor growth at first was considerably slowed in the diabetic mice. As the tumor progressed and blood sugar was reduced, the tumor growth rate increased to that of non-diabetics, but in all cases, the cancerous diabetic mice live longer than cancerous non-diabetic ones.

Greater longevity was also observed in cancerous obese mice with higher than normal blood sugar but no diabetes.

Apparently the diabetic condition causes changes in life chemistry that interfere with the supply of some substance vitally needed for growth of cancer cells.

"If we can pinpoint this link in the chemical chain of events, it may suggest new chemotherapy for cancer," Dr. McKee reports in *Cancer Research*.

Science News Letter, March 24, 1956

AERONAUTICS

Unfamiliar Shapes Seen For Airplanes of Future

➤ LARGE SUPERSONIC AIRPLANES of the future will have unfamiliar shapes, a Boeing Airplane Company engineer has predicted.

George S. Schairer, one of the scientists responsible for designing the Boeing 707, U. S. jet transport scheduled to enter airline service in 1959, said aerodynamic requirements for most efficient supersonic flight would result in the unusual shapes.

High temperatures, and stability and control associated with supersonic flight, are the next problems to be faced, he told the Aviation Division Conference of the American Society of Mechanical Engineers meeting in Los Angeles.

High-speed airplanes will need very thin, comparatively wide chord wings for best supersonic cruising, Mr. Schairer said. A given size control surface will provide very much less control in high-speed flight than in subsonic flight.

"Creep" is also a problem. Wings might bend under load at high temperatures and remain permanently bent. Titanium metal shows desirable qualities and it may be used in sandwich form.

The pilot and other humans aboard future airplanes, Mr. Schairer said, are the most inflexible item of equipment from the point of view of temperature toleration.

Science News Letter, March 24, 1956

ASTRONOMY

Innermost Planets Visible

Mercury and Venus can both be seen in the evenings of late April. Jupiter and Saturn are also visible in the evenings, and Mars appears in the early morning hours.

By JAMES STOKLEY

➤ MERCURY AND VENUS, the two planets nearer to the sun than earth, will both be visible in the west during evenings toward the end of April.

Two of the other five naked-eye planets will also be seen on April evenings, while the last will appear in the early morning hours.

Venus continues to dominate the evening sky, and on April 12 sets about four hours after the sun. As darkness falls, it appears high in the southwest, in the constellation of Taurus, the bull. Of magnitude minus 4, it far exceeds any star in brilliance.

All month Venus will be seen, but only in the last few days of April will it be joined by Mercury, innermost of all the planets of the solar system, only 36,000,000 miles from the sun.

At the end of April Mercury will set about an hour and a half after sunset, and this means that it will have gone down before the sky is entirely dark. However, if there is a clear view toward the west, you should be able to see it in the gathering dusk, close to the horizon and many times fainter than Venus.

Venus Outshines Jupiter

Second only to Venus is Jupiter, which is almost an eighth the brightness of the more brilliant orb. It is seen high in the south in Leo, the lion, near the star Regulus.

Around 10:30 p.m., about the time that Venus is setting, Saturn rises in the southeast, in Scorpius, the scorpion. It is about as much fainter than Jupiter as that planet is fainter than Venus.

Finally, about 2:30 a.m. at the first of April and an hour earlier at the end of the month, Mars appears in the southeast, about the same brightness as Saturn.

Both Venus and Jupiter are shown on the accompanying maps, which depict the skies for about 10:00 p.m., your own kind of standard time, at the first of April, an hour earlier at the middle and two hours earlier at the end.

These also show the background of distant stars, against which the planets appear to move.

Some of the bright constellations of the winter evenings are still present, but are descending in the west. Sirius, in Canis Major, the greater dog, is low in the southwest, and to the right of this star most of Orion remains visible.

This great constellation, known as the warrior, is characterized by the three stars in a row (just under the word Orion on the map) that form his belt. Betelgeuse is above. Still higher is Procyon, in Canis Minor, the lesser dog, and Pollux, in Gemini, the twins.

Low in the northwest, to the right of Orion, we find Aldebaran, in Taurus, the bull, the group in which Venus is standing. Above and to the right of this figure stands Auriga, the charioteer, with first-magnitude Capella.

Turning to the north, the great dipper, which is part of Ursa Major, the great bear, is seen high in the sky. The dipper is inverted, with the pointers to the left. These indicate the position of Polaris, the pole-star, which is below.

Dipper Guide to Arcturus

If you follow the curve of the dipper's handle around toward the south, you will come to two more bright stars—Arcturus, in Bootes, the bear-driver, and Spica, in Virgo, the virgin. This gro[illegible]to the left of Leo, and a little lowe[illegible]

One more first magni[illegible]shown on our maps, although it is so n[illegible]the horizon that its brightness is considerably dimmed. This is Vega, in Lyra, the lyre, near the northeastern horizon.

During the coming months it will become much more conspicuous, and will shine overhead on August evenings.

On April 17 Jupiter reaches another stage in a series of maneuvers it has been engaged in for recent months. Anyone who has been watching this planet is getting a good idea of the way it moves through the sky in a series of loops.

Last fall Jupiter, then a morning star, was moving from day to day in an easterly direction in the sky, and early in November it passed close to Regulus. On Dec. 18, however, this motion ceased; it started moving toward the west, passing Regulus again at the end of January. But on April 17, this movement halts momentarily, and the planet again starts eastward.

This will take it past Regulus again in early July. Its easterly motion will continue until Jan. 17, 1957, when it will be in the constellation of Virgo, and it will start back to the west once more. Then it will back up until May 19, when it will again be in Leo, but not as far as Regulus.

The reason for this is that the planets are all moving around the sun, and so are we, on the earth. Thus the movement they seem to take in the sky is a combination of their motion and that of the moving platform on which we are located.

All the planets go around the sun toward the east, and the farther out they are, the more slowly they move, in miles per second. The earth's speed is about 18.5 miles per second, while that of Jupiter is only 8.1 miles per second. Thus, when earth and Jupiter are both in the same direction from the sun, we dash past at more than twice the speed of the other planet.

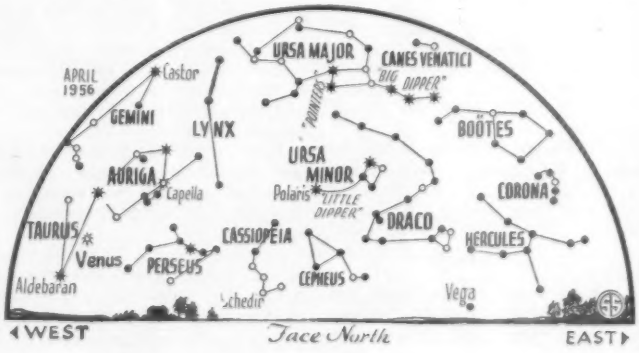
Retrograde Motion

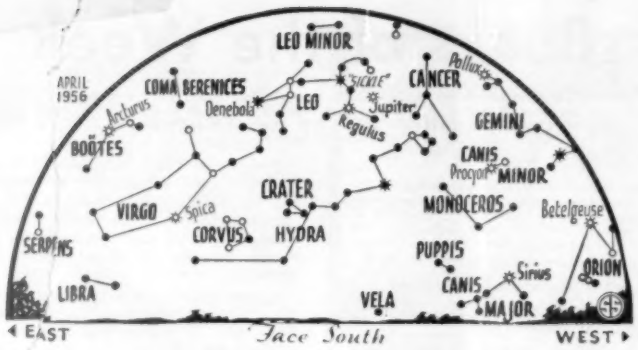
Jupiter seems to retrograde, or move backward, toward the west. That is what began last Dec. 18, and ends on April 17.

A very similar effect can be noticed if you are on an express train that passes a slow local on the next track. Even though both are going in the same direction, to passengers on the express the local train seems to be going the opposite way.

Venus is now so prominent because it is farthest east of the sun on April 12, and then sets the longest time after sunset.

Since the orbit of Venus is within that of the earth, it can never get far enough away from the sun in the sky to be seen in the opposite direction. It swings first to one





SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS

side of the sun and then to the other. When toward the east, as now, it follows the sun across the sky in its daily motion, and remains visible after sunset.

On the other hand, when west of the sun, it rises ahead of that body and is then a morning star, seen in the east before sunrise.

The same is true of Mercury, but its orbit is within that of Venus, so it remains still closer to the sun. In fact, it can never get far enough away to be seen in a really dark sky, but appears in the east, at dawn, or in the west, at dusk.

On May 2 it will be at its farthest east position, called greatest eastern elongation, and for a few days before and after this will be seen in the evening sky.

Celestial Time Table for April

April EST

3	3:06 a. m.	Moon in last quarter
	5:00 a. m.	Moon farthest, distance 251,000 miles
	11:56 p. m.	Moon passes Mars
10	9:39 p. m.	New moon
12	1:00 p. m.	Venus farthest east of sun
14	9:01 a. m.	Moon passes Venus
15	5:00 p. m.	Moon nearest, distance 229,300 miles
17	2:00 p. m.	Jupiter halts westerly movement and resumes eastward motion among the stars
	6:28 p. m.	Moon in first quarter
19	2:15 p. m.	Moon passes Jupiter
24	8:40 p. m.	Full moon
26	11:51 p. m.	Moon passes Saturn

Subtract one hour for CST, two hours for MST, and three for PST.

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GENERAL SCIENCE

Easter Lilies and Bunnies Are Easter Symbols

See Front Cover

➤ THE HAPPY YOUNGSTER shown on the cover of this week's SCIENCE NEWS LETTER is looking at the cuddly white rabbit he has received for Easter, along with the lily he will give his mother.

Both the lily and the bunny are a part of Easter today and both symbolically have roots deep in the early festivals held by the pagans about this time of the year.

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GENERAL SCIENCE

Population of Future Will Follow the Sun

➤ IN THE SEARCH for ways to trap the energy of sunlight to power our mechanical civilization, the world may again see some of the great population shifts that have occurred from time to time as mankind has settled one new area after another.

Although no doubt fortunes will be made in today's thickly populated temperate zones on inventions using the sun's priceless fuel, the present drive toward use of solar energy comes from fear of looming poverty.

Long before man appeared on this planet, the sun's energy was invested in growing a great quantity of plant life. The carbon compounds locked up in these plant structures accumulated to form treasure hoards in underground deposits of coal and oil.

Millions of years' accumulation of this treasure has been tapped to fuel our high-energy civilization, but in less than two centuries we have nearly used it up. Although it is true that some oil is forming daily, this drop-in-the-bucket rate is not going to save us from a change in our way of living.

With the ingenuity already developed by experience in building machines to use fossil fuels, and whetted by the recent applications of nuclear energy to producing useful power, mankind will probably solve the problems inherent in use of solar energy before our heritage of fossil fuel runs out.

As soon as sunshine-using devices become at all practical, the ancient semi-tropical river valleys where civilization first began will probably see a new spurt of immigration by gadget-minded people.

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Books of the Week

For the editorial information of our readers, books received for review since last week's issue are listed. For convenient purchase of any U. S. book in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N Street, N.W., Washington 6, D. C. Request free publications direct from publisher, not from Science Service.

ALCOHOLISM: Its Psychology and Cure—Frederick B. Rea—*Philosophical Library*, 143 p., $3.50. Bringing together the results of recent research in this field.

ARCTIC RESEARCH: The Current Status of Research and Some Immediate Problems in the North American Arctic and Subarctic—Diana Rowley, Ed.—*Arctic Institute of North America*, Special Publication No. 2, 261 p., illus., $3.50. Reporting what has been accomplished and pointing to what still needs to be done.

BETWEEN THE PLANETS—Fletcher G. Watson—*Harvard University Press*, rev. ed., 188 p., plus 67 plates, $5.00. Telling of the small but sometimes spectacular bodies that occupy the space between the sun and planets of the solar system.

CHEMICAL SAFETY SUPERVISION—Joseph Guelich—*Reinhold*, 221 p., illus., $4.50. For the supervisor whose men work with chemicals, telling him what dangers he faces and how to prevent accidents.

THE CHEMISTRY OF TANNING PROCESSES—K. H. Gustavson—*Academic*, 403 p., illus., $9.00. Providing a general outline of the chemistry of principal tanning processes with emphasis on chrome tanning as the most economical and also the most thoroughly investigated process.

COEFFICIENT OF VOLUME EXPANSION FOR PETROLEUM WAXES AND PURE N-PARAFFINS—P. R. Templin—*Mellon Institute*, 8 p., illus., paper, free upon request direct to publisher, 4400 Fifth Ave., Pittsburgh 13, Pa.

THE DOCTORS MAYO—Helen Clapesattle—*Pocket Books*, 484 p., paper, 50 cents. A biography of the remarkable family of doctors and the story of their dedication to medicine. A pocket edition of a book originally published by the University of Minnesota in 1941. The author was selected by the University to write the biography.

ECONOMIC GEOGRAPHY OF INDUSTRIAL MATERIALS—Albert S. Carlson, Ed.—*Reinhold*, 494 p., illus., $12.50. Written by industrial experts and edited by a geographer, this work will aid the manufacturing executive in planning for economical production.

EDUCATIONAL PSYCHOLOGY IN THE CLASSROOM—Henry Clay Lindgren—*Wiley*, 521 p., illus., $5.00. To help teachers understand the students they teach, as well as the principles underlying the process of education.

ELECTRONIC DATA PROCESSING FOR BUSINESS AND INDUSTRY—Richard G. Canning—*Wiley*, 332 p., illus., $7.00. Presenting the general methods followed by practically all experienced systems engineers, and intended to aid management to plan for the efficient use of this new method.

FASTER, FASTER: A Simple Description of a Giant Electronic Calculator and the Problems It Solves—W. J. Eckert and Rebecca Jones—*McGraw-Hill*, 160 p., illus., $3.75. The calculator described is the NORC, designed and built for the Bureau of Ordnance of the U. S. Navy.

THE FOCUSED INTERVIEW: A Manual of Problems and Procedures—Robert K. Merton, Marjorie Fiske and Patricia L. Kendall—*Free Press*, 186 p., $3.00. This report of the Bureau of Applied Social Research of Columbia University describes a special technique in social research.

GENERAL BIOLOGY—Harrington Wells and Patrick H. Wells—*McGraw-Hill*, 520 p., illus., $6.50. A beginning and integrative college text.

GIFTED CHILDREN: The Cleveland Story—Theodore Hall—*World Publishing Co.*, 91 p., illus., $2.00. Telling what the Cleveland Public Schools are doing to discover and educate the superior child.

INFLUENCE OF GRINDING FLUIDS UPON RESIDUAL STRESSES IN HARDENED STEEL—H. R. Letner—*Mellon Institute*, 6 p., illus., paper, free upon request direct to publisher, 4400 Fifth Ave., Pittsburgh 13, Pa. Describing experiments in which air, two concentrations of rust inhibitor in water, six water-miscible oils and four straight grinding oils were employed.

LAND, AIR & OCEAN—R. P. Beckinsale—*Duckworth (Essential Books)*, 370 p., illus., $4.00. Although primarily for university students, this book is also directed to the general public interested in "the heaven above, the earth beneath, or in the water under the earth."

THE PHYSICAL WORLD—Paul McCorkle—*McGraw-Hill*, 2d ed., 465 p., illus., $5.25. Text for a survey and orientation course.

PORTRAITS FROM MEMORY: Recollections of a Zoologist—Richard B. Goldschmidt—*University of Washington Press*, 181 p., illus., $3.50. Informal reminiscing by the author about personal contacts with great zoologists of the past.

PREHISTORIC PEOPLE OF THE NORTHERN SOUTHWEST—Joe Ben Wheat—*Grand Canyon Natural History Association*, Bulletin No. 12, 38 p., illus., paper, 58 cents. Replacing Bulletin

No. 7, "Prehistoric Man in the Southwest," completely rewritten to bring the subject up to date.

PSYCHOPHARMACOLOGY: A Symposium organized by the Section on Medical Sciences of the AAAS and the American Psychiatric Association and Presented at the Berkeley Meeting December 30, 1954—Nathan S. Kline with foreword by Winfred Overholser—*American Association for the Advancement of Science*, Publication No. 42, 165 p., $3.50. Ten studies on the use of chlorpromazine and reserpine in treating the mentally ill.

THE RADIO AMATEURS HANDBOOK—Headquarters Staff, A.R.R.L.—*American Radio Relay League, 33d ed.*, 569 p., plus vacuum tube data, illus., paper, $3.00 plus postage. The standard reference work for the "ham." This new edition contains a new chapter on semiconductors.

TABLES OF THE FUNCTION ARC SIN Z—Staff, Computation Laboratory—*Harvard University Press*, 586 p., $12.50. An introduction to the tables tells how they were computed and treats of the properties of this and related functions.

TREATISE ON INVERTEBRATE PALEONTOLOGY: Part P, Arthropoda 2—Raymond C. Moore, Ed. —*Geological Society of America* and *University of Kansas Press*, 181 p., illus., $3.50. The fifth independent part of a treatise presenting a comprehensive, compact and authoritative statement on invertebrate fossil groups.

WORLD BOOK OF GREAT INVENTIONS—Jerome S. Meyer— *World Publishing Co.*, 270 p., illus., $3.95. Among the inventions included are the ancient use of fire, the wheel and the lever, and the very modern zipper.

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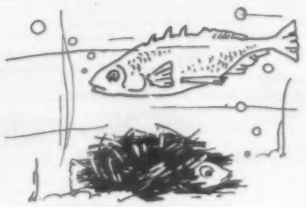
BIOLOGY

NATURE RAMBLINGS

by Horace Loftin



Home Is a Castle

➤ THE DESIRE for a home, a little corner of one's own, seems a basic urge in much of the animal kingdom. Creatures from fish and reptiles to man have developed strong feelings for their "territory," that area which is theirs alone to live in.

The size of an animal's territory generally depends on how strong the individual is and how large an area he can successfully defend. Weak animals that cannot maintain territories large enough to give them ample food and protection are the ones first eliminated in the struggle for existence.

Among the fish, the male stickleback is a good example of a stalwart defender of his "home." This fish is armed with sharp spines that he uses to good effect when another comes too close to his nest. Battles between sticklebacks can result in death to the loser.

Incidentally, it is papa stickleback who builds the nest and cares for the eggs and young. After egg-laying, the female loses interest in domestic affairs and, knocking the rear of the nest out, swims away forever.

The little Anolis lizard is another home lover. The male defends a restricted area, in which he maintains a harem of females. Any male approaching his domain is driven away, but females are corraled and added to his collection. Within the old sultan's territory, each female maintains her own small private area.

Birds are strongly territorial, and even the smallest wren can drive away a larger bird that comes too close to home. Most experts now think that bird singing is a means of proclaiming "rights" to territory.

During fall and winter, both male and female mockingbirds have their own separate territories. But with the coming of the breeding season, the female abandons her private property to live in that of her mate.

Among the mammals, the howler monkeys exemplify the home lover. These powerfully voiced monkeys live in family groups, or clans, consisting of an adult male, several females and the young. Close guard is kept over the territory by fighting and vocalizing. Howling duels of rival clans in adjacent territories can be heard more than a mile away through the jungle.

Science News Letter, March 24, 1956

Questions

BIOCHEMISTRY—What makes redheads different? p. 181.

☐ ☐ ☐

GENETICS—How might shock act during pregnancy? p. 178.

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HOME ECONOMICS—What can make kitchen walls gray besides dirt? p. 181.

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PSYCHIATRY—How is a slot machine helping scientists study the mentally ill? p. 180.

☐ ☐ ☐

PHOTOGRAPHS: Cover and p. 181, Fremont Davis; p. 179, Battelle Memorial Institute; p. 182, Wenner-Gren Foundation; p. 183, University of Michigan; p. 192, Reelway Products Company.

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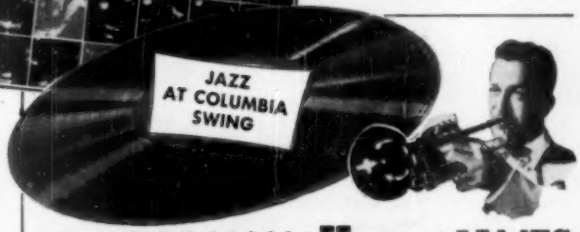

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· New Machines and Gadgets ·

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REFLECTOR FLASH UNIT for cameras combines the light-reflecting efficiency of a polished surface reflector with that of a matte surface for even light distribution. Powered by either dry cells or B.C. cartridges, the flash unit can be removed for storage.

Science News Letter, March 24, 1956

CRACK FILLER is ready mixed and comes in a spout-top squeeze package. The compound is described as chipproof, peelproof and crackproof, and will take nails and screws. It is available in eight colors and four woodtones to match home decoration.

Science News Letter, March 24, 1956

WATER PURIFIER for homes, farms, ranches and roadside stores consists of an automatic chlorinator, a water filter and the necessary hardware for installing it. The small, eight and one-quarter inch filter can be installed in any kitchen.

Science News Letter, March 24, 1956

CLOTHES LINE REEL, shown in the photograph, is designed to be hidden in the basement or garage. The free end of the line is tied or hooked to a tree or pole outside. When not being used, the released line automatically snakes back inside and winds itself around the reel. It operates under spring tension.

Science News Letter, March 24, 1956

UNDERGROUND SPRINKLER SYSTEM can be installed by the home gardener with only a few tools. It features solid brass sprinklers, stainless steel clamps and polyethylene plastic pipes that resist freezing, rotting and corrosion. Instructions for installation comes with the 47-piece kit.

Science News Letter, March 24, 1956

PORTABLE DICTATING INSTRUMENT weighs only six pounds and can be carried in a brief case or over the shoulder. The microphone, power cord and a supply of recording discs are self-contained. The disc, which operates on 33-1/3 rpm machines, can be mailed to home or office from "on the road."

Science News Letter, March 24, 1956

HOME WAXER holds as much as a pint of liquid wax in its transparent handle. Fingertip pressure releases the liquid to the waxing pad. The removable waxing pad has four application surfaces and can either be washed or thrown away. The handle is made of butyrate plastic.

Science News Letter, March 24, 1956

UTENSIL SET contains a knife and fork that fit together to form a small portable dinnerware kit. Imported from Germany, the utensils are made of stainless steel and cherry wood. The eight and one-half inch long set can be carried in the purse or pocket.

Science News Letter, March 24, 1956

Do You Know?

Standards for boys' knitted outer *clothing* are based on measurements of 66,000 boys living in various parts of the United States.

Specialists have expressed the opinion that *polio* as a major cause of crippling or fatal disease may be eliminated within two years.

Pigs weighing 100 pounds gain an additional 100 pounds on less feed when they are kept at about 70 degrees Fahrenheit.

A method for giving a permanent curl to chicken *feathers* to obtain bulking qualities comparable to goose down has recently been developed.

Compared with hand hoeing, chemical control of *weeds* in Mississippi Delta cotton during 1954-55 cut labor needs by as much as 80%.

White *carnations* have been changed into red ones by high-energy nuclear radiation.